REMARKS

Reconsideration of this application is respectfully requested.

I Status of the Claims

Claims 1, 21 and 22 are pending and at issue.

II Rejections Under 35 U.S.C. § 103(a) over Cheng, etc.

Claims 1 and 22 stand rejected under 35 U.S.C. §103(a) as obvious over Cheng (U.S. Patent No. 5,720,671) in view of Kobayashi (U.S. Patent No. 4,682,504), Japanese Patent JP 06-114131 (JP '131), and Japanese Patent JP 09-140840 (JP '840).

Applicants respectfully traverse the above rejection. The Examiner has not made a *prima facie* showing of obviousness as Cheng, Kobayasji, JP '131 and JP '840, alone or in combination, do not teach or suggest every element of the claimed invention. Rather, the Examiner is improperly using hindsight to reject the claims.

The present claims are directed to a golf club shaft having the following structure:

Claim 1

The layers, as recited in claim 1, can be in one of three positions, parallel to the longitudinal axis (0°), perpendicular to the longitudinal axis (90°), or angled to the longitudinal axes (Θ).

TABLE 1

LAYER	ORIENTATION TO THE LONGITUDINAL AXIS
First Angled	Θ
First Straight	0°
Second Angled	Θ
Second Straight	0°

Thus, the number, orientation and order of the layers result in the strength, flexural rigidity and light weight of the golf club shaft.

Prior to the arguments regarding the references, below is a table outlining the differences in the order of the layers between the invention of claim 1 and the prior art.

TABLE 2

Invention	Layer 1 (1st Ang)	Layer 2 (1st Str)	Layer 3 (2nd Ang)	Layer 4 (2nd Str)	Layer 5	Layer 6	Layer 7
Present Invention	Θ	0°	Θ	0°	-	-	-
Cheng- Fig 2	Θ	Θ	0°	-	-	-	-
Cheng - Fig 2*	Θ	0°	-	-	-	-	-
Cheng - Ex.	Θ	Θ	Θ	Θ	Θ	0°	0°
Cheng - Ex.*	Θ	Θ	Θ	0°	0°	0°	0°
JP '131	0°	Θ	0°	Θ	0°	-	-
JP '840-1*$	90°	Θ	90°	90°	0°	0°	0°
JP '840-2*$	90°	Θ	0°	90°	0°	90°	0°
JP '840-3*$	90°	Θ	0°	0°	90°	90°	0°
Kusumoto	0°	90°	Θ	90°	0°	0°	-

* Note: Applicants combined two angled layers into one, as shown in Kusumoto.
$ Applicants only illustrated the first three embodiments for illustration purposes; the other embodiments are also dissimilar to the claims of the present invention.

The Examiner admits that Cheng does not disclose full length layers or the presently claimed torsional strength. Kobayshi does not provide the motivation to one of ordinary skill in the art to combine Cheng with JP '131 to provide Cheng's golf club shaft with

increased torsional strength. Kobayshi is silent about what is required to increase the torsional strength of a golf club shaft. Kobayshi only states in column 1, lines 13-25 that:

> Generally, a golf-club shaft is subjected to flexure and torsion when swung during play or practice. A golf player feels the degree of flexure and torsion as a shaft stiffness. A club shaft having small flexure and torsion has a stiff feel, and a club shaft having large flexure and torsion has a soft feel. Generally, a player having a strong swing can move a club shaft at a high head speed, and thus a stiffer club shaft, i.e., a shaft having small flexure and torsion, is more suitable for such a player. A player with a weak swing, however, moves a club shaft at a low head speed, and thus a softer shaft, i.e., a shaft having large flexure and torsion is more suitable for such a player.

This merely recites that there is a difference between a club with a stiff feel and a club with a soft feel. Actually, Cheng's assignee, Harrison Sports, Inc., sells shafts that cover a full range of flexure. *See*, Exhibit A, Harrison Sport's website (www.harrison.com). Kobyashi adds nothing to the disclosure of Chang or any combination of the references.

The Examiner states that Cheng discloses a first angled layer 22b/22c and a first straight layer 22a, and that Cheng discloses 10-20 layers and that the layers are repeated to form the layers of the claimed invention. The Examiner is incorrect; Cheng does not disclose which layer should be the inner layer. The section of Figure 2 does not illustrate the "inside" of the golf club shaft or the mandrel. If Cheng's example in column 3, lines 9-12 is followed, one of ordinary skill in the art would use 5 angled layers and 5 parallel layers (*see*, Table 2 above), but Cheng does not disclose repeating the pattern set forth in Figure 2. Additionally, none of Cheng's layering suggestions match the layers disclosed in JP '131 and JP '840.

Applicants further submit that it would require undue experimentation for one of ordinary skill in the art to arrive at the layers of the presently claimed invention. Cheng discloses using 10 to 20 layers. The layers can be positioned in up to four positions. The

layers can assume the positions of being parallel to the longitudinal axis of the golf club shaft or straight (0°); perpendicular to the longitudinal axis of the golf club shaft (90°) or positively or negatively angled with respect to the longitudinal axis of the golf club shaft (+Θ or - Θ). If the total number of positions and layers are considered (4 positions and 20 layers) there are 160,000 different variations (20^4) of layers. Additionally, one of ordinary skill in the art is not motivated to just substitute layers of a different orientation because each specific orientation confers a specific benefit to the strength of the golf club shaft. The references teach that the specific order of the layers may also be important and one of ordinary skill in the art is not motivated to act contrary to that teaching.

Further, Exhibit A demonstrates that Cheng's assignee, Harrison Sports, Inc. does not sell a graphite golf club shaft lighter than 50 grams in weight. *See*. Exhibit A, the "SL 50 Series". Accordingly, one of ordinary skill in the art is taught away from lightening Cheng's golf club shaft below 50 grams.

The further combination of JP '131 and JP '840 also fails to render the presently claimed invention obvious. The Examiner states that, in view of Kobayshi, one of ordinary skill in the art would be motivated to modify Cheng to select a golf club shaft with a torsional strength of at least 120 kgf x m x degrees (as in JP '131) and a weight of 30 to 40 grams (as in JP '840).

JP '131 discloses a different layer structure than both Cheng and the presently claimed invention. JP '131 discloses, in Figure 1, four layers; 0° layer 51, + Θ layer 52, 0° layer 53, and - Θ layer 54. JP '131's layers are ordered differently than those of both Cheng and the present invention. Furthermore, JP '131 does not disclose that a golf club shaft can

achieve a twisting strength of "230 kgf cm" and remain between about 30 to about 40 grams in weight.

JP '840 discloses a golf club shaft between 10 and 50 grams but none of JP '840's embodiments disclose the layers of JP '131 or the presently claimed invention. *See*, Table 2, above. The Examiner is improperly selecting disparate parts from the two references to "piece together" the presently claimed invention using hindsight. It is improper to combine the references for their individual properties regardless of the layer structure disclosed. Deviation in the number, orientation or specific order of the layers of a golf club shaft will alter the physical properties of the golf club shaft. For example, U.S. Patent No. 3,646,610 to Jackson (referred to below) states that the "longitudinal threads and their dispositioning provides the desired flexure."

Accordingly, it is believed that this rejection should be withdrawn.

III Rejections Under 35 U.S.C. § 103(a) over Jackson, etc.

Claim 21 stands rejected under 35 U.S.C. §103(a) over Jackson (U.S. Patent 3,646,610) in view of JP '131, Kusumoto (U.S. Patent 6,106,413), JP '840, Preece et al. (U.S. Patent No. 6,126,557) (hereinafter "Preece"), and Cecka (U.S. Patent No. 4,157,181).

Applicants respectfully traverse the above rejection. Jackson, Kusumoto, JP '131, JP '840, Preece and Cecha do not, alone or in combination, disclose every element of the claimed invention. Applicants submit that the structure of the invention as claimed in claim 21, is follows:

Claim 21

Further to the structure recited in claim 1, the angled layer can be comprised of sublayers which are positively or negatively angled to the longitudinal axis ($0° < \Theta < 90° = +\Theta$; $270° < \Theta < 360° = -\Theta$).

TABLE 3

LAYER	SUB-LAYER/ FIBER MATERIAL	ORIENTATION TO THE LONGITUDINAL AXIS
First Angled	First Layer	+/-Θ
	Second Layer	-/+Θ
First Straight	Third layer	0°
Second Angled	Fourth Layer	+/-Θ
	Fifth Layer	-/+Θ
Second Straight	Sixth Layer	0°

Prior to the arguments regarding the references, below is a table outlining the differences in the layering between the invention of claim 21 and the prior art.

TABLE 4

Present Invention	First Angled (Θ)		First Straight (0°)	Second Angled (Θ)		Second Straight (0°)	
	First layer 1 +/-Θ	Second layer 1 +/-Θ	0°	First layer 2 +/-Θ	Second layer 2 -/+Θ	0°	-
Jackson (Fig 15)	Layer 40' 0°	Layer 43' +/-Θ	Layer 43' -/+Θ	Layer 47' 0°	Layer 50' +/-Θ	Layer 53' -/+Θ	Layer 54' 0°
Jackson with "Chopped" layers	Layer 40' 0°	Layer 42' Θ	Layer 43' +/-Θ	Layer 43' -/+Θ	Layer 46' Θ	Layer 47' 0°	Layer 49' Θ
JP '131	Layer 51 0°	Layer 52 +Θ	Layer 53 0°	Layer 54 -Θ	-	-	-

JP '840$	Layer 1	Layer 2	Layer 3	Layer 4	Layer 5	Layer 6	Layer 7
Ex. 1	90°	+/- Θ	-/+Θ	90°	90°	0°	0°
Ex. 2	90°	+/- Θ	-/+Θ	0°	90°	0°	90°
Ex. 3	90°	+/- Θ	-/+Θ	0°	0°	90°	90°

Kusumoto	Layer 1 0°	Layer 2 90°	Layer 3a +/- Θ	Layer 3b -/+Θ	Layer 4 90°	Layer 5 0°	Layer 6 0°
Preece	Layer 11 +/- Θ	Layer 12 -/+Θ	Layer 13 +/- Θ	Layer 14 -/+Θ	Layer 16 0°	Layer 18 0°	Layer 20 0°
Cecka	Layer 11 Θ	Layer 12 Θ	Layer 13 Θ	Layer 14 Θ	Layer 15 Θ	Layer 16 Θ	-

$ Applicants only illustrated the first three embodiments for illustration purposes; the other embodiments are also dissimilar to the claims of the present invention.

The Examiner states that Jackson's Figure 15 discloses the first angled layer (43'), the first straight layer (47'), the second angled layer (50') and the second straight layer

(54'). Applicants respectfully disagree. Figure 15 of Jackson discloses one of two arrangements. Neither arrangement discloses the four layers of the present invention.

One arrangement taught by Jackson is a five layer structure with a first straight layer (40'), a first angled layer (43'), a second straight layer (47'), a second angled layer (50') and a third straight layer (54'). However, present claim 21 recites that the first angled layer is orientated at an angle to the long axis of the golf club shaft while Jackson's layer 40' is parallel to the long axis of the golf club shaft. The Examiner also ignores layer 40' and is improperly selects only specific layers. Neither Jackson nor the combination of Jackson with the secondary references disclose omitting the base layer of Jackson's golf club shaft. Omitting a layer would weaken and alter the properties of the golf club shaft. Jackson clearly discloses that that the first layer must be parallel to the long axis of the golf club shaft. *See*, Jackson, Figures 8, 13, 14, 15, and 16.

doesn't claim most inner layer

Another arrangement of layers taught and suggested by Jackson is a nine layer structure including a first straight layer (40'), a first angled layer (42'), a second angled layer (43'), a third angled layer (46') a second straight layer (47'), a fourth angled layer (49'), a fifth angled layer (50'), a sixth angled layer (53') and a third straight layer (54'). Layers 42', 46', 49', and 53' are "short, chopped fiber glass filaments ... disposed in random orientation." Jackson, column 5, lines 4-22. These are not the angled layers of the present invention. Also, Jackson teaches that the "chopped fibers ... oppose shear forces tending to fracture the shaft." Jackson, column 3, lines 55-58. Thus, one of ordinary skill in the art would be motivated, if anything, to omit layers 42', 46', 49', and 53', leaving only the straight layers.

JP '131's layers, as discussed above, are different that those in both Jackson and the present invention and cannot be properly combined with Jackson for the reason discussed above. The number, orientation, and order of the layers are parameters which achieve the claimed characteristics of the present golf club shaft, including strength, flexural rigidity and light weight.

Additionally, the Examiner states that one of ordinary skill in the art would modify Jackson's golf club shaft to have sufficient layers extend over the entire length of the golf club shaft. Applicants respectfully submit that one of ordinary skill in the art is not motivated to extend the length of each layer. One of ordinary skill in the art would not be motivated to add layers, knowing the layers will increase the weight of the golf club shaft. Jackson discloses a golf club shaft weighing 0.31 pounds or 140 grams. *See*, Jackson column 4, lines 1-12. The claim of the present invention discloses a golf club shaft weighing from about 30 to about 40 grams. Jackson's golf club shaft weighs approximately 3.5 to 4.5 times more than the golf club shaft of the present invention. Although Jackson clearly states that layers can be added, one of ordinary skill in the art is not motivated to add or subtract layers from Jackson's golf club shaft. Adding layers or the extending of the layers may be taught, but would only increase the weight of the golf club shaft beyond the weight of the present invention and reducing layers is not taught, and would weaken the golf club shaft.

The Examiner states that Kusumoto teaches a second angled layer between 0.04 and 0.1 mm as prepreg sheets not larger than 0.06 mm. Again, Kusumoto does not disclose the layers in the same orientation and order of the present invention. There is no motivation or suggestion that the particular reinforcement layers of Kusumoto would be obvious to combine

with Jackson. Kusumoto's method of combining layers does not even approximate the features of the presently claimed invention. Kusmoto discloses AP prepreg, in which the fibers of the prepreg sheet are angled to the longitudinal axis of the golf club shaft, and SP prepreg, where the fibers of the prepreg sheet are parallel to the longitudinal axis of the golf club shaft. *See*, Kusmoto, column 2, lines 38-45. The intermediate sheet, which is the only sheet disclosed with a size no greater than 0.06 mm, is disposed between an AP prepreg layer and the SP prepreg layer. As illustrated in Kusmoto, Figure 2, the intermediate layer is a perpendicular layer (90°) and is sandwiched between an angled layer and a straight layer, or Kusumoto's configuration is Θ, 90°, 0° for the section surrounding the "second angled layer". Ignoring the fact that the Examiner is improperly attempting to choose one layer when the entire structure of Kusmoto is different, Applicants will just focus on the intermediate layer and its surrounding layers.

The second angled layer of the presently claimed invention is located between to straight layers ("SP layers"), resulting in a 0°, Θ, 0° configuration. Kusumoto specifically teaches that the intermediate layer is to be sandwiched between the AP prepreg layer and the SP prepreg layer.

> When a layer of AP prepreg ... is made to closely adhere to a layer of SP prepreg ... blow holes occur on an interface ... so that separation and damage tend to occur. However, when the thin layer of prepreg of high resin is provided between the layer of AP prepreg and the layer of SP prepreg ... it becomes difficult for blow holes to be generated on the interface. Accordingly, the occurrence of separation is prevented, and the mechanical strength between the layers can be enhanced.

Kusumoto, column 2, line 58 to column 3, line 3. Given the above, one of ordinary skill in the art is not taught to change the layers surrounding the intermediate layer and is thus not motivated to combine Kusumoto's layers with Jackson.

As stated above, none of JP '840's embodiments disclose the layers of JP '131, Jackson or the presently claimed invention. Thus, Applicants submit that there is no motivation to combine JP '131 with JP '840 and then additionally combine the two with Jackson. Again, the Examiner is selecting disparate parts from the two references to "piece together" the presently claimed invention using hindsight.

The Examiner is selecting individual features of Preece and Cecka and ignoring the overall structure of their disclosure. Neither of the references discloses the layering as disclosed in the present invention, or any other of the above cited references. Additionally, Cecka does not disclose straight or parallel layers and Cecka states the "orientation relationships between layers ... [achieves] the unique combination of properties [of the Cecka's invention]." Cecka, Abstract. Thus, one of ordinary skill in the art is not motivated to select any of Cecka's physical properties to combine with another reference without taking the entire structure that lends itself to the particular properties.

Thus, it is improper to combine Preece and Cecka with Jackson, JP '131, JP '840 and Kusumoto.

In summary, none of the four above references disclose or suggest, alone or in combination, the entire claimed invention.

Applicants respectfully submit that some of the novelty in the presently claimed invention and the references is the specific number, orientation, and specific ordering of the

layers. However, the Examiner is treating mixing and matching layers as obvious without any direct, and sometimes conflicting, motivation. One of ordinary skill in the art, in general, is not motivated to add or subtract a specific layer without direct teaching. The goal of all of the references is a light and strong golf club shaft. One of skill in the art is not motivated to add layers, which increase the weight of the golf club shaft, or subtract layers, which reduce the strength of the golf club shaft, without specific motivation. Additionally, one of ordinary skill in the art is not motivated to just substitute layers of different orientation because each specific orientation confers a specific benefit to the strength of the golf club shaft. The references teach that the specific order of the layers may also be important and one of ordinary skill in the art is not motivated to act contrary to that teaching.

In conclusion, none of the references, alone or in combination, teach or suggest all of the elements of the presently claimed invention. Additionally, neither the references nor the Examiner's comments provide sufficient motivation to one of ordinary skill in the art to either combine the references or provide the teachings absent from the references. Thus, Applicants respectfully request that the above rejections be withdrawn.

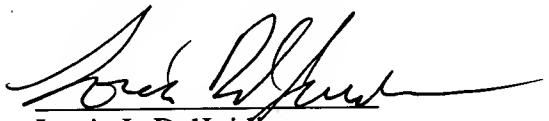
CONCLUSION

In view of the foregoing, it is believed that claims 1, 21 and 22 are in condition for allowance and it is respectfully requested that the application be reconsidered and that the pending claim be allowed and that the case is passed to issue.

If there are any other issues remaining to be examined or believed to be resolved to either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

Dated: April 22, 2003

Respectfully submitted,



Louis J. DelJuidice
Reg. No. 47,522
Agent for Applicants

DARBY & DARBY P.C.
Post Office Box 5257
New York, NY 10150-5257
212-527-7700